

Remarks

Upon entry of the foregoing amendment, claims 1-26 are pending in the application, with claims 1, 7, 13, and 19 being the independent claims. Claims 1, 7, 13, 19, and 22 are sought to be amended to clarify the invention. These changes are believed to introduce no new matter, and their entry is respectfully requested. Based on the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Rejections under 35 U.S.C. § 102

Claims 13, 15-16, and 18 stand rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,792,250 to Zarubin (hereinafter " Zarubin"). Applicants traverse this rejection based on the discussion below.

Zarubin

Zarubin is concerned with canceling an unwanted spurious RF signal component in a wireless ***transmitter***. (See, Zarubin, Abstract, col. 1, lines 9-13 *emphasis added*) . Referring to FIG. 2, Zarubin is specifically concerned with canceling the noise spur 210 that is higher than the passband 205 containing the carrier frequency at the output of a wireless transmitter. (FIG.2, col. 3, lines 36-40). Zarubin accomplishes this by using network 445 (FIG.2) that is configured to provide ***high pass filtering***, attention, and phase shifting of the noise spur 210 to generate a phase shifted signal 425 that is used for spur cancellation in the power combiner 450. (See, Zarubin, FIGs. 4-5, col. 6, lines 58-64) In doing so, "the resistive network composed of R₁ and R₂, together with

capacitance C supply the high pass filtering required to isolate the sideband spur present in the prefiltered incoming signal 420, *while rejecting the frequency components of signal 420 occurring within the bandpass region [205]*". (Zarubin, col. 6, lines 60-65, *emphasis added*)

Accordingly, *Zarubin does not attenuate and phase shift the intended transmit signal 205*, but only the undesired noise spur 210. This is further re-enforced by col. 5, lines 33-38, which recite "*Because, the phase-shifted signal contains only the unwanted spur*, the 180 degree out-of-phase (phase-shifted) signal 425 directly cancels the in-phase (filtered output) signal to produce an output signal 430, the noise and spurious of which has been significantly reduced or altogether eliminated." (col. 5, lines 33-38)

Applicant's claim 13

Applicant's claim 13 recites a *receiver portion* for suppressing an image channel, including, in part:

an attenuator having an attenuation *at said desired channel and said image channel both* determined by an attenuation of said image channel at an output of said bandpass filter. (See, Claim 1, *emphasis added*)

It is first noted that Applicants' invention recites *receiver portion*, which is substantially and fundamentally different from the *transmitter operations* taught by Zarubin. Further, as discussed above, *Zarubin does not attenuate* the desired transmit signal 205, because the high pass filtering function in the network 445 rejects the desired transmit signal 205, and therefore it is not present in the phase-shifted signal 425 that is later used for cancellation.

In contrast, Applicant's claim 13 explicitly recites an attenuator having an attenuation *at said desired channel and said image channel both determined by an attenuation of said image channel at an output of said bandpass filter.* (See, Applicant's, claim 13) Zarubin does not teach or suggest attenuating the desired channel *determined by an attenuation of said image channel at an output of said bandpass filter*, and in fact teaches away from this, by using a highpass filter that only passes the unwanted spur 210, and rejects the desired channel. (See, Zarubin, col. 6, lines 60-65) In other words, the high pass filtering of Zarubin categorically precludes the network 445 from attenuating the desired channel based on an attenuation of the image channel at an output of said bandpass filter, as recited in claim 13.

Accordingly, based on the discussion herein, it is clear that Zarubin does not teach each and every feature of claim 13, and therefore does not anticipate claim 13. Therefore, Applicants request that the rejection under 35 § U.S.C. 102(e) be removed and that claim 13 be passed to allowance. Claims 15-16, and 18 depend directly or indirectly from claim 13, and therefore are patentable for being dependent on an allowable base claim, in addition to their own patentable features.

Rejections under 35 U.S.C. § 103

Claims 14 and 17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Zaubin. Applicants traverse below.

Claims 14 and 17 depend directly or indirectly from an independent claim 13, which is allowable over Zaubin for the reasons mentioned above. Accordingly, claims 14 and 17 are allowable over Zarubin for being dependent on an allowable base claim, in addition to their own patentable features.

Claims 1-2, 5-12, 19, 21, and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,177,964 to Birleson *et al.* in view of Zarubin. Applicants traverse below.

The Office Action allegedly relies on Zarubin to teach or suggest the image cancellation features for the independent claims. However, independent claims 1 and 7 include features similar to those discussed above for claim 13, and therefore these claims are allowable over Zarubin for at least the same reasons as discussed above for claim 13.

For example, independent claim 1 includes the feature of *attenuating the input signal, including the desired channel and the image channel, by the stopband attenuation of the bandpass filter to provide an attenuated signal*. (See claim 1, as amended) As discussed above, Zarubin does not teach or suggest *attenuating the input signal, including the desired channel and the image channel, by the stopband attenuation of the bandpass filter* for the reasons discussed above in regards claim 13. Specifically, the high pass filtering of the desired channel in Zarubin precludes *attenuating the desired channel by the stopband attenuation of the bandpass filter*, as recited in claim 1. Birleson does not cure the defects of Zarubin, nor does the Office Action suggest this.

Likewise, independent claim 7 includes the feature of *generating an image cancellation signal from the first IF signal, the image cancellation signal having an amplitude at the frequencies of the desired channel and the image channel substantially equal to the amplitude of the image channel in the first filtered IF signal and a phase that is offset by approximately 180 degrees from the image channel in the first filtered IF signal*. (See claim 7) As discussed above, Zarubin does not teach or suggest *generating the image cancellation signal having an amplitude at the frequencies*

of the desired channel and the image channel substantially equal to the amplitude of the image channel, because the Zarubin does not attenuate and phase shift the desired channel, as discussed above for claim 13. In other words, the high pass filtering of network 445 in Zarubin precludes the claimed signal processing functions of the desired channel, as recited in Applicant's claim 7. Birleson does not cure the defects of Zarubin, nor does the Office Action suggest this.

Likewise, independent claim 19 includes the feature of *an image cancellation circuit, coupled in parallel with said bandpass filter, having a passband response at said image channel and said desired channel that is substantially equal in amplitude and opposite in phase of a response of said bandpass filter at said image channel*. (See, claim 19) As discussed above, Zarubin does not teach or suggest *an image cancellation circuit having a passband response at said image channel and said desired channel that is substantially equal in amplitude and opposite in phase of a response of said bandpass filter at said image channel*, because Zarubin does not attenuate and phase shift the desired channel, as discussed above for claim 13. In other words, the high pass filtering of network 445 in Zarubin precludes the claimed signal processing functions of the desired channel, as recited in Applicant's claim 19. Further, Birleson does not cure the defects of Zarubin, nor does the Office Action suggest this.

Accordingly, Birleson in view of Zarubin does not teach each and every feature of independent claims 1, 7, and 19, and therefore does not meet the requirements of *prima facie* obviousness. (See, MPEP 2143) Further, claims 2 and 5-6 depend directly or indirectly from independent claim 1, and therefore are allowable for being dependent on an allowable base claim in addition to their own patentable features. Further, claims 8-12 depend directly or indirectly from independent claim 7, and therefore are allowable for

being dependent on an allowable base claim, in addition to their own patentable features. Further, claims 21 and 23-26 depend directly or indirectly from independent claim 19, and therefore are allowable for being dependent on an allowable base claim in addition to their own patentable features.

Claims 3-4, 20, and 22 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Birleson in view of Zarubin and further in view of Applicant's admitted prior art (AAPA, pages 1-3). Applicants traverse below.

Claims 3-4 depend directly or indirectly from independent claim 1, which is patentable over Birleson in view of Zarubin based on the discussion above. AAPA does not cure the defects of Birleson in view of Zarubin in regards to claim 1. Accordingly, claims 3-4 are patentable over Birleson in view of Zarubin and further in view of AAPA, for being dependent on an allowable base claim in addition to their own patentable features.

Claims 20 and 22 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Birleson in view of Zarubin and further in view of AAPA. Claims 20 and 22 depend directly or indirectly from independent claim 19, which is patentable over Birleson in view of Zarubin based on the discussion above. AAPA does not cure the defects of Birleson in view of Zarubin in regards to claim 19. Accordingly, claims 20 and 22 are patentable over Birleson in view of Zarubin and further in view of AAPA, for being dependent on an allowable base claim in addition to their own patentable features.

Further, claim 22 includes the feature of an attenuator having an attenuation that approximately matches an attenuation of said bandpass filter *at said image channel and said desired channel*. As discussed above in regards to claim 13, the combination of Birleson in view of Zarubin does not teach or suggest this feature. AAPA does not cure

this defect. Accordingly, claims 22 is patentable over Birleson in view of Zarubin and further in view of AAPA.

Based on the discussion above, Applicants request that the rejection under 35 U.S.C. 103(a) be reconsidered and removed and that all the pending claims be passed to allowance.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.



Jeffrey T. Helvey
Attorney for Applicant
Registration No. 44,757

Date: 5/23/07

1100 New York Avenue, N.W.
Washington, D.C. 20005-3934
(202) 371-2600

678524_1.DOC